

ETHYLENE OXIDE EMISSIONS ESTIMATES

Constants

Ethylene Oxide Molecular Weight	44.05 lb/lb-mol
Assumed Ambient Pressure	14.696 psia
Universal Gas Constant	10.73 psia-ft ³ / lbmol-degR
Temperature Conversion (F to R)	459.67 plus temperature in units of deg. F
Mass Conversion	453.6 grams per pound

Water Balancer found drained out

LSAH 30.623 Found Frozen

Exhaust Calculations

Ethylene Oxide Concentration [ppmv]	Exhaust Flow [acfm]	Exhaust Temperature [deg. F]	Period of Exhaust [min]	Exhaust Temperature [deg R]	Ethylene Oxide Emission Rate [lbs/min]	Ethylene Oxide Emissions [lbs]	Ethylene Oxide Emissions [g]
2.43	5,156	105	20	564.7	1.34E-03	2.68E-02	12.14
2.57	5,156	105	20	564.7	1.42E-03	2.83E-02	12.84
2.21	5,156	105	20	564.7	1.22E-03	2.43E-02	11.04
1.93	5,156	105	20	564.7	1.06E-03	2.13E-02	9.65
2.12	5,156	105	20	564.7	1.17E-03	2.34E-02	10.60
1.92	5,156	105	20	564.7	1.06E-03	2.12E-02	9.60
1.84	5,156	105	20	564.7	1.01E-03	2.03E-02	9.20
1.86	5,156	105	20	564.7	1.02E-03	2.05E-02	9.30
1.84	5,156	105	20	564.7	1.01E-03	2.03E-02	9.20
2.35	5,156	105	20	564.7	1.29E-03	2.59E-02	11.74
2.54	5,156	105	20	564.7	1.40E-03	2.80E-02	12.69
1.89	5,156	105	20	564.7	1.04E-03	2.08E-02	9.45
1.95	5,156	105	20	564.7	1.07E-03	2.15E-02	9.75
1.94	5,156	105	20	564.7	1.07E-03	2.14E-02	9.70
1.37	5,156	105	20	564.7	7.55E-04	1.51E-02	6.85
1.44	5,156	105	20	564.7	7.93E-04	1.59E-02	7.20
0.43	5,156	105	20	564.7	2.37E-04	4.74E-03	2.15
1.32	5,156	105	20	564.7	7.27E-04	1.45E-02	6.60
0.23	5,156	105	20	564.7	1.27E-04	2.53E-03	1.15
0	5,156	105	20	564.7	0.00E+00	0.00E+00	0.00
0	5,156	105	20	564.7	0.00E+00	0.00E+00	0.00
0	5,156	105	20	564.7	0.00E+00	0.00E+00	0.00
0	5,156	105	20	564.7	0.00E+00	0.00E+00	0.00
0	5,156	105	20	564.7	0.00E+00	0.00E+00	0.00
0	5,156	105	20	564.7	0.00E+00	0.00E+00	0.00
0	5,156	105	20	564.7	0.00E+00	0.00E+00	0.00
0	5,156	105	3	564.7	0.00E+00	0.00E+00	0.00
Total:					1.88E-02	0.377	170.82

ETHYLENE OXIDE EMISSIONS ESTIMATES

Constants

Ethylene Oxide Molecular Weight	44.05 lb/lb-mol
Assumed Ambient Pressure	14.696 psia
Universal Gas Constant	10.73 psia-ft ³ / lbmol-degR
Temperature Conversion (F to R)	459.67 plus temperature in units of deg. F
Mass Conversion	453.6 grams per pound

Level Sensor Frozen

Exhaust Calculations

Ethylene Oxide Concentration [ppmv]	Exhaust Flow [acfm]	Exhaust Temperature [deg. F]	Period of Exhaust [min]	Exhaust Temperature [deg R]	Ethylene Oxide Emission Rate [lbs/min]	Ethylene Oxide Emissions [lbs]	Ethylene Oxide Emissions [g]
2.41	5,156	105	16	564.7	1.33E-03	2.12E-02	9.64
2.37	5,156	105	20	564.7	1.31E-03	2.61E-02	11.84
2.02	5,156	105	20	564.7	1.11E-03	2.23E-02	10.10
2.09	5,156	105	20	564.7	1.15E-03	2.30E-02	10.45
2.14	5,156	105	20	564.7	1.18E-03	2.36E-02	10.69
1.95	5,156	105	20	564.7	1.07E-03	2.15E-02	9.75
1.87	5,156	105	20	564.7	1.03E-03	2.06E-02	9.35
1.9	5,156	105	20	564.7	1.05E-03	2.09E-02	9.50
1.79	5,156	105	20	564.7	9.86E-04	1.97E-02	8.95
1.56	5,156	105	20	564.7	8.59E-04	1.72E-02	7.80
1.58	5,156	105	20	564.7	8.70E-04	1.74E-02	7.90
1.49	5,156	105	20	564.7	8.21E-04	1.64E-02	7.45
1.53	5,156	105	20	564.7	8.43E-04	1.69E-02	7.65
1.53	5,156	105	5	564.7	8.43E-04	4.21E-03	1.91
Total:					1.44E-02	0.271	122.94

Down 2:53 am to 3:26am - No Data (GC malfunction)

ETHYLENE OXIDE EMISSIONS ESTIMATES

Constants

Ethylene Oxide Molecular Weight	44.05 lb/lb-mol
Assumed Ambient Pressure	14.696 psia
Universal Gas Constant	10.73 psia-ft ³ / lbmol-degR
Temperature Conversion (F to R)	459.67 plus temperature in units of deg. F
Mass Conversion	453.6 grams per pound

High Concentration 30.630/30.633 - no cleaning and reset

Exhaust Calculations

Ethylene Oxide Concentration [ppmv]	Exhaust Flow [acfm]	Exhaust Temperature [deg. F]	Period of Exhaust [min]	Exhaust Temperature [deg R]	Ethylene Oxide Emission Rate [lbs/min]	Ethylene Oxide Emissions [lbs]	Ethylene Oxide Emissions [g]
2.11	5,156	105	7	564.7	1.16E-03	8.14E-03	3.69
1.98	5,156	105	20	564.7	1.09E-03	2.18E-02	9.90
1.92	5,156	105	11	564.7	1.06E-03	1.16E-02	5.28
Total:					3.31E-03	0.042	18.86

ETHYLENE OXIDE EMISSIONS ESTIMATES

Constants

Ethylene Oxide Molecular Weight	44.05 lb/lb-mol
Assumed Ambient Pressure	14.696 psia
Universal Gas Constant	10.73 psia-ft ³ / lbmol-degR
Temperature Conversion (F to R)	459.67 plus temperature in units of deg. F
Mass Conversion	453.6 grams per pound

High Concentration 30.630/30.633 - Cleaned lens and reset

Exhaust Calculations

Ethylene Oxide Concentration [ppmv]	Exhaust Flow [acfm]	Exhaust Temperature [deg. F]	Period of Exhaust [min]	Exhaust Temperature [deg R]	Ethylene Oxide Emission Rate [lbs/min]	Ethylene Oxide Emissions [lbs]	Ethylene Oxide Emissions [g]
1.74	5,156	105	2	564.7	9.59E-04	1.92E-03	0.87
1.63	5,156	105	20	564.7	8.98E-04	1.80E-02	8.15
1.5	5,156	105	14	564.7	8.26E-04	1.16E-02	5.25
Total:					2.68E-03	0.031	14.26

ETHYLENE OXIDE EMISSIONS ESTIMATES

Constants

Ethylene Oxide Molecular Weight	44.05 lb/lb-mol
Assumed Ambient Pressure	14.696 psia
Universal Gas Constant	10.73 psia-ft ³ / lbmol-degR
Temperature Conversion (F to R)	459.67 plus temperature in units of deg. F
Mass Conversion	453.6 grams per pound

Exhaust Calculations

Ethylene Oxide Concentration [ppmv]	Exhaust Flow [acfm]	Exhaust Temperature [deg. F]	Period of Exhaust [min]	Exhaust Temperature [deg R]	Ethylene Oxide Emission Rate [lbs/min]	Ethylene Oxide Emissions [lbs]	Ethylene Oxide Emissions [g]
1.01	5,156	105	15	564.7	5.56E-04	8.35E-03	3.79
0.96	5,156	105	15	564.7	5.29E-04	7.93E-03	3.60
Total:					1.09E-03	0.016	7.38

1.92

ETHYLENE OXIDE EMISSIONS ESTIMATES

Constants

Ethylene Oxide Molecular Weight	44.05 lb/lb-mol
Assumed Ambient Pressure	14.696 psia
Universal Gas Constant	10.73 psia-ft ³ / lbmol-degR
Temperature Conversion (F to R)	459.67 plus temperature in units of deg. F
Mass Conversion	453.6 grams per pound

Low airflow cleaned tubing and fittings

Exhaust Calculations

Ethylene Oxide Concentration [ppmv]	Exhaust Flow [acfm]	Exhaust Temperature [deg. F]	Period of Exhaust [min]	Exhaust Temperature [deg R]	Ethylene Oxide Emission Rate [lbs/min]	Ethylene Oxide Emissions [lbs]	Ethylene Oxide Emissions [g]
2.93	5,156	105	5	564.7	1.61E-03	8.07E-03	3.66
2.73	5,156	105	20	564.7	1.50E-03	3.01E-02	13.64
Total:					3.12E-03	0.038	17.30

ETHYLENE OXIDE EMISSIONS ESTIMATES

Constants

Ethylene Oxide Molecular Weight	44.05 lb/lb-mol
Assumed Ambient Pressure	14.696 psia
Universal Gas Constant	10.73 psia-ft ³ / lbmol-degR
Temperature Conversion (F to R)	459.67 plus temperature in units of deg. F
Mass Conversion	453.6 grams per pound

Low Airflow - cleared debris in tubing

Exhaust Calculations

Ethylene Oxide Concentration [ppmv]	Exhaust Flow [acfm]	Exhaust Temperature [deg. F]	Period of Exhaust [min]	Exhaust Temperature [deg R]	Ethylene Oxide Emission Rate [lbs/min]	Ethylene Oxide Emissions [lbs]	Ethylene Oxide Emissions [g]
1.16	5,156	105	5	564.7	6.39E-04	3.20E-03	1.45
Total:					6.39E-04	0.003	1.45

ETHYLENE OXIDE EMISSIONS ESTIMATES

Constants

Ethylene Oxide Molecular Weight	44.05 lb/lb-mol
Assumed Ambient Pressure	14.696 psia
Universal Gas Constant	10.73 psia-ft ³ / lbmol-degR
Temperature Conversion (F to R)	459.67 plus temperature in units of deg. F
Mass Conversion	453.6 grams per pound

High Concentration - cleaned mirrors and lens

Exhaust Calculations

Ethylene Oxide Concentration [ppmv]	Exhaust Flow [acfm]	Exhaust Temperature [deg. F]	Period of Exhaust [min]	Exhaust Temperature [deg R]	Ethylene Oxide Emission Rate [lbs/min]	Ethylene Oxide Emissions [lbs]	Ethylene Oxide Emissions [g]
1.3	5,156	105	7	564.7	7.16E-04	5.01E-03	2.27
1.19			20				
1.22	5,156	105	3	564.7	6.72E-04	2.02E-03	0.91
Total:					1.39E-03	0.007	3.19

ETHYLENE OXIDE EMISSIONS ESTIMATES

Constants

Ethylene Oxide Molecular Weight	44.05 lb/lb-mol
Assumed Ambient Pressure	14.696 psia
Universal Gas Constant	10.73 psia-ft ³ / lbmol-degR
Temperature Conversion (F to R)	459.67 plus temperature in units of deg. F
Mass Conversion	453.6 grams per pound

Exhaust Calculations

Ethylene Oxide Concentration [ppmv]	Exhaust Flow [acfm]	Exhaust Temperature [deg. F]	Period of Exhaust [min]	Exhaust Temperature [deg R]	Ethylene Oxide Emission Rate [lbs/min]	Ethylene Oxide Emissions [lbs]	Ethylene Oxide Emissions [g]
6.92	5,156	105	15	564.7	3.81E-03	5.72E-02	25.94
6.84	5,156	105	15	564.7	3.77E-03	5.65E-02	25.64
Total:					7.58E-03	0.114	51.58

ETHYLENE OXIDE EMISSIONS ESTIMATES

Constants

Ethylene Oxide Molecular Weight	44.05 lb/lb-mol
Assumed Ambient Pressure	14.696 psia
Universal Gas Constant	10.73 psia-ft ³ / lbmol-degR
Temperature Conversion (F to R)	459.67 plus temperature in units of deg. F
Mass Conversion	453.6 grams per pound

PM on E-250 & E-251 Caused alarm (2 alarms that day)

Exhaust Calculations

Ethylene Oxide Concentration [ppmv]	Exhaust Flow [acfm]	Exhaust Temperature [deg. F]	Period of Exhaust [min]	Exhaust Temperature [deg R]	Ethylene Oxide Emission Rate [lbs/min]	Ethylene Oxide Emissions [lbs]	Ethylene Oxide Emissions [g]
1.5	5,156	105	20	564.7	8.26E-04	1.65E-02	7.50
1.46	5,156	105	20	564.7	8.04E-04	1.61E-02	7.30
1.27	5,156	105	9	564.7	7.00E-04	6.30E-03	2.86
2.49	5,156	105	8	564.7	1.37E-03	1.10E-02	4.98
Total:					3.70E-03	0.050	22.63

ETHYLENE OXIDE EMISSIONS ESTIMATES

Constants

Ethylene Oxide Molecular Weight	44.05 lb/lb-mol
Assumed Ambient Pressure	14.696 psia
Universal Gas Constant	10.73 psia-ft ³ / lbmol-degR
Temperature Conversion (F to R)	459.67 plus temperature in units of deg. F
Mass Conversion	453.6 grams per pound

Lost pressure

Exhaust Calculations

Ethylene Oxide Concentration [ppmv]	Exhaust Flow [acfm]	Exhaust Temperature [deg. F]	Period of Exhaust [min]	Exhaust Temperature [deg R]	Ethylene Oxide Emission Rate [lbs/min]	Ethylene Oxide Emissions [lbs]	Ethylene Oxide Emissions [g]
3.04	5,156	105	6	564.7	1.67E-03	1.00E-02	4.56
2.79	5,156	105	14	564.7	1.54E-03	2.15E-02	9.76
2.49	5,156	105	12	564.7	1.37E-03	1.65E-02	7.47
Total:					4.58E-03	0.048	21.78

ETHYLENE OXIDE EMISSIONS ESTIMATES

Constants

Ethylene Oxide Molecular Weight	44.05 lb/lb-mol
Assumed Ambient Pressure	14.696 psia
Universal Gas Constant	10.73 psia-ft ³ / lbmol-degR
Temperature Conversion (F to R)	459.67 plus temperature in units of deg. F
Mass Conversion	453.6 grams per pound

Multiple alarms

Exhaust Calculations

Ethylene Oxide Concentration [ppmv]	Exhaust Flow [acfm]	Exhaust Temperature [deg. F]	Period of Exhaust [min]	Exhaust Temperature [deg R]	Ethylene Oxide Emission Rate [lbs/min]	Ethylene Oxide Emissions [lbs]	Ethylene Oxide Emissions [g]
0.56	5,156	105	15	564.7	3.08E-04	4.63E-03	2.10
0.62	5,156	105	20	564.7	3.42E-04	6.83E-03	3.10
3.89	5,156	105	20	564.7	2.14E-03	4.29E-02	19.44
5.36	5,156	105	20	564.7	2.95E-03	5.91E-02	26.79
3.44	5,156	105	4	564.7	1.90E-03	7.58E-03	3.44
Total:					7.64E-03	0.121	54.86

ETHYLENE OXIDE EMISSIONS ESTIMATES

Constants

Ethylene Oxide Molecular Weight	44.05 lb/lb-mol
Assumed Ambient Pressure	14.696 psia
Universal Gas Constant	10.73 psia-ft ³ / lbmol-degR
Temperature Conversion (F to R)	459.67 plus temperature in units of deg. F
Mass Conversion	453.6 grams per pound

High Concentration Alarm - mirrors cleaned and reset

Exhaust Calculations

Ethylene Oxide Concentration [ppmv]	Exhaust Flow [acfm]	Exhaust Temperature [deg. F]	Period of Exhaust [min]	Exhaust Temperature [deg R]	Ethylene Oxide Emission Rate [lbs/min]	Ethylene Oxide Emissions [lbs]	Ethylene Oxide Emissions [g]
1.95	5,156	105	3	564.7	1.07E-03	3.22E-03	1.46
1.84	5,156	105	20	564.7	1.01E-03	2.03E-02	9.20
1.82	5,156	105	9	564.7	1.00E-03	9.02E-03	4.09
Total:					3.09E-03	0.033	14.75

ETHYLENE OXIDE EMISSIONS ESTIMATES

Constants

Ethylene Oxide Molecular Weight	44.05 lb/lb-mol
Assumed Ambient Pressure	14.696 psia
Universal Gas Constant	10.73 psia-ft ³ / lbmol-degR
Temperature Conversion (F to R)	459.67 plus temperature in units of deg. F
Mass Conversion	453.6 grams per pound

Exhaust Calculations

Ethylene Oxide Concentration [ppmv]	Exhaust Flow [acfm]	Exhaust Temperature [deg. F]	Period of Exhaust [min]	Exhaust Temperature [deg R]	Ethylene Oxide Emission Rate [lbs/min]	Ethylene Oxide Emissions [lbs]	Ethylene Oxide Emissions [g]
2.43	5,156	105	14	564.7	1.34E-03	1.87E-02	8.50
2.43	5,156	105	20	564.7	1.34E-03	2.68E-02	12.14
2.1	5,156	105	8	564.7	1.16E-03	9.25E-03	4.20
Total:					3.83E-03	0.055	24.84

ETHYLENE OXIDE EMISSIONS ESTIMATES

Constants

Ethylene Oxide Molecular Weight	44.05 lb/lb-mol
Assumed Ambient Pressure	14.696 psia
Universal Gas Constant	10.73 psia-ft ³ / lbmol-degR
Temperature Conversion (F to R)	459.67 plus temperature in units of deg. F
Mass Conversion	453.6 grams per pound

Balancer pump not running - replaced

Exhaust Calculations

Ethylene Oxide Concentration [ppmv]	Exhaust Flow [acfm]	Exhaust Temperature [deg. F]	Period of Exhaust [min]	Exhaust Temperature [deg R]	Ethylene Oxide Emission Rate [lbs/min]	Ethylene Oxide Emissions [lbs]	Ethylene Oxide Emissions [g]
0.43	5,156	105	20	564.7	2.37E-04	4.74E-03	2.15
0.1	5,156	105	20	564.7	5.51E-05	1.10E-03	0.50
0.33	5,156	105	20	564.7	1.82E-04	3.64E-03	1.65
0.28	5,156	105	20	564.7	1.54E-04	3.08E-03	1.40
Total:					6.28E-04	0.013	5.70

ETHYLENE OXIDE EMISSIONS ESTIMATES

Constants

Ethylene Oxide Molecular Weight	44.05 lb/lb-mol
Assumed Ambient Pressure	14.696 psia
Universal Gas Constant	10.73 psia-ft ³ / lbmol-degR
Temperature Conversion (F to R)	459.67 plus temperature in units of deg. F
Mass Conversion	453.6 grams per pound

High Concentration - Cleaned Mirrors

Exhaust Calculations

Ethylene Oxide Concentration [ppmv]	Exhaust Flow [acfm]	Exhaust Temperature [deg. F]	Period of Exhaust [min]	Exhaust Temperature [deg R]	Ethylene Oxide Emission Rate [lbs/min]	Ethylene Oxide Emissions [lbs]	Ethylene Oxide Emissions [g]
8.32	5,156	105	10	564.7	4.58E-03	4.58E-02	20.79
7.86	5,156	105	20	564.7	4.33E-03	8.66E-02	39.28
7.54	5,156	105	20	564.7	4.15E-03	8.31E-02	37.68
6.47	5,156	105	20	564.7	3.56E-03	7.13E-02	32.33
6.59	5,156	105	11	564.7	3.63E-03	3.99E-02	18.11
Total:					2.03E-02	0.327	148.20

ETHYLENE OXIDE EMISSIONS ESTIMATES

Constants

Ethylene Oxide Molecular Weight	44.05 lb/lb-mol
Assumed Ambient Pressure	14.696 psia
Universal Gas Constant	10.73 psia-ft ³ / lbmol-degR
Temperature Conversion (F to R)	459.67 plus temperature in units of deg. F
Mass Conversion	453.6 grams per pound

High Concentration - Cleaned Mirrors

Exhaust Calculations

Ethylene Oxide Concentration [ppmv]	Exhaust Flow [acfm]	Exhaust Temperature [deg. F]	Period of Exhaust [min]	Exhaust Temperature [deg R]	Ethylene Oxide Emission Rate [lbs/min]	Ethylene Oxide Emissions [lbs]	Ethylene Oxide Emissions [g]
1.13	5,156	105	7	564.7	6.23E-04	4.36E-03	1.98
1.15	5,156	105	20	564.7	6.34E-04	1.27E-02	5.75
1.07	5,156	105	18	564.7	5.89E-04	1.06E-02	4.81
Total:					1.85E-03	0.028	12.54

ETHYLENE OXIDE EMISSIONS ESTIMATES

Constants

Ethylene Oxide Molecular Weight	44.05 lb/lb-mol
Assumed Ambient Pressure	14.696 psia
Universal Gas Constant	10.73 psia-ft ³ / lbmol-degR
Temperature Conversion (F to R)	459.67 plus temperature in units of deg. F
Mass Conversion	453.6 grams per pound

Exhaust Calculations

Ethylene Oxide Concentration [ppmv]	Exhaust Flow [acfm]	Exhaust Temperature [deg. F]	Period of Exhaust [min]	Exhaust Temperature [deg R]	Ethylene Oxide Emission Rate [lbs/min]	Ethylene Oxide Emissions [lbs]	Ethylene Oxide Emissions [g]
	5,156	105		564.7	0.00E+00	0.00E+00	0.00
	5,156	105		564.7	0.00E+00	0.00E+00	0.00
	5,156	105		564.7	0.00E+00	0.00E+00	0.00
Total:					0.00E+00	0.000	0.00